CHILTON'S

OCTOBER 1992

FOOD ENGINEERING

SINCE 1928, THE SOURCE ON PROCESSING, PACKAGING, AND PRODUCT DEVELOPMENT

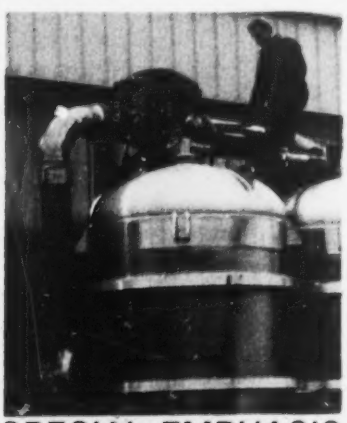
5-DIGIT 20814
40
****
194 FE
JEANNE LONG
CONGRESSIONAL INF SVC
4520 EAST-WEST HWY
BETHESDA
MD 20814-3319

FOOD ENGINEERING

ABOUT THE COVER

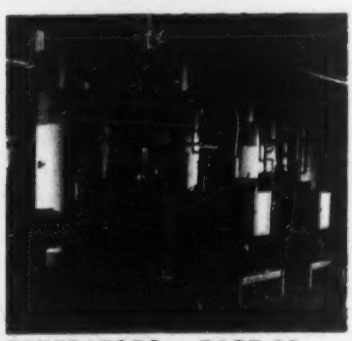
Food labs just aren't what they used to be. Today's laboratory, embracing new technology, contract services and integrated management techniques, is a far cry from the lab of even several years ago.

PAGES 127 TO 140



SPECIAL EMPHASIS

PAGES 147 TO 150



GENERATORS: **PAGE 82**

ENGINEERED FOODS

36 Rapid Pathogen Screening Now Available
New process enables rapid screening of the genera Salmonella and Listeria and Staphylococcal enterotoxin.

39 Bacterial Counts in Thirty Minutes
A technique used for water quality testing since the '70s is finding increased use in the food industry.

42 Saying 'I do' to Partnerships
Food Engineering's roundtable discussion focuses on food company/supplier partnerships.

48 Choices—Healthy Disclosures
Recent events suggest the need for more candor with the press from both industry and the scientific community.

PROCESSING & CONTROL

72 Natural Lactic Acid Plant Opens Doors
Ecological Chemical Products Co. (Ecochem), a 50/50 joint venture between DuPont and ConAgra, started up a $20-million lactic acid plant mid-August.

76 Stork Integrates Shelf-stable Systems
Stork Food Machinery has developed an "integrated shelf stability" program for single-source supply and responsibility of food sterilization systems.

85 Size of Pilot Dryer Critical in Simulation
What works for the 100 lb. per hour pilot dryer doesn't guarantee success during large-scale production.

86 Online—Simulation
Whether scaling up, upgrading an existing facility, or setting controllers, consider the use of simulation.

FOOD PACKAGING

104 Blowmolded Plastic Replaces Glass Jugs
Ocean Spray Cranberries, Inc., looking for a replacement for its one-gallon glass juice jugs, will choose plastic.

106 Combination Package Helps Environment
German packaging system combines a paperboard folding carton and coextruded plastic film.

110 Trendwatch—Packaging Waste
Germany's dual-system for recycling—a model for the future or a blueprint for chaos?

FEATURES

127 The Food Lab's Changing Identity
Food companies are turning to contract services and embracing integrated management techniques to keep the laboratory structure lean and mean.

141 Packaging Buyers Survey
Improved barrier materials and machinery advances lead the way in packaging purchases for the coming year.

147 Pumps for All Seasons
From sludge to syrup, soups to stews, fruits to fish—there's a pump for every purpose.

153 PACK EXPO '92 Gets Green
Top packaging show offers ways to cope with consumer demand for environmentally-friendly packaging.

159 Hill's: Team Management Design
New pet food plant by Hill's Division of Colgate-Palmolive features "socio-tech" work environment, human-food standards and flexible manufacturing.

DEPARTMENTS

11 Editorial
12 Calendar
14 Industry Report
172 New Products
181 People
198 The Final Analysis

JESSE H. NEAL AWARD-WINNING EDITORS

Publisher of Food Engineering Master Catalog and Food Engineering International
Co-sponsor of Food Plants '92
Co-sponsor of Food Labs '92

Permission to photocopy for internal use or the internal use of specific clients is granted by Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 27 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/85 $1.00 + 25¢)

FOOD ENGINEERING® (ISSN 0193-323X) October 1992, Vol. 64, No. 10. Published monthly by Chilton Company, One Chilton Way, Radnor, PA 19089 (Telephone 215/964-4000). Chilton Co., one of the ABC Publishing Companies, a part of Capital Cities/ABC Inc., New York, NY. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office

™Chilton Company, 1992. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 2035, Radnor, PA 19089.

PACKAGING BUYERS SURVEY

Improved barrier materials and machinery advances lead the way in packaging purchases for the coming year.

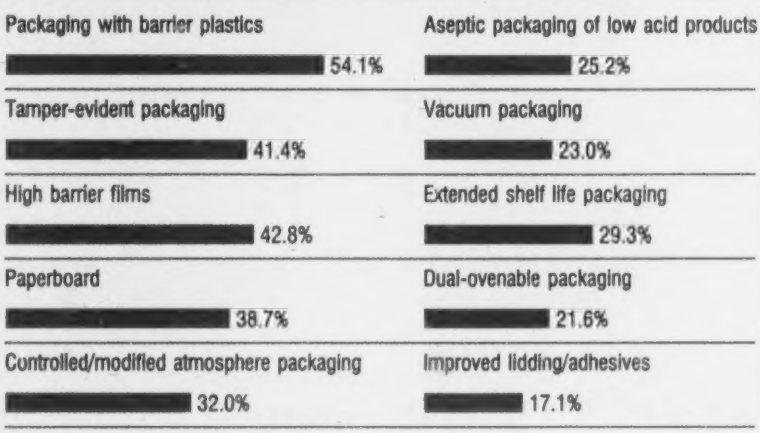
MARGIE J. RUSSELL
TECHNICAL EDITOR

The results are in on *Food Engineering's* seventh annual Packaging Buyers Survey and the members of the Executive Advisory Panel continue to seek better plastic packaging materials for their products, to the probable chagrin of watchful environmentalists. The more than 500 members of the panel told us that packaging with barrier plastics ranks at the top of the technologies that are likely to be the most important to them over the next two years. Coming in a strong second was packaging with high barrier films, as some 48 percent of our respondents indicated that this category would be an important area in their firms for the next two years. Some had special requests from suppliers including:

- "A low cost, high barrier, clear plastic rigid container that is easily recyclable."—director, technical services for a spice company.
- "We need reusable containers with the barrier and inert properties of glass."—senior vice president of operations for a beverage manufacturer.
- "A plastic jar suitable for pickles that is heat resistant with vacuum capability. The container must have good market appearance."—director of packaging systems for a Midwest food processor.
- "A clear flexible film that has the

Important Packaging Areas

Respondents were asked to check the areas of food packaging likely to be of most importance to their firms over the next two years.

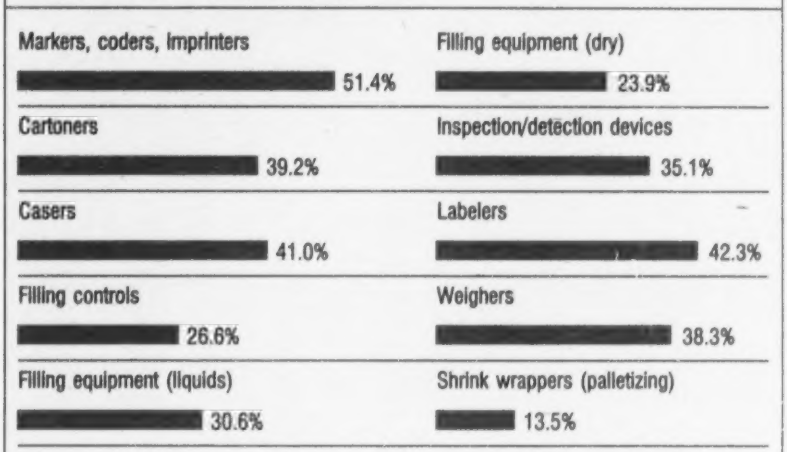


Source: Food Engineering's Packaging Survey 1992.

PACKAGING BUYERS SURVEY

Machinery Purchases

Respondents were asked to check the types of packaging machinery their operation purchased in the past twelve months.



Source: Food Engineering's Packaging Survey 1992.

Spending Trends

Respondents were asked to indicate expenditures on equipment in 1992.

Source: Food Engineering's Packaging Survey 1992.

barrier properties of metallized film." – director of packaging for a Northeast processor.

One member, though, went all out when he wished for a "flexible, clear film with oxygen and moisture barrier properties capable of maintaining the oxygen and moisture level in the food and package for five years." Yet, as good a wish as it is, such a wish usually has a major drawback: acceptable disposal. Now that legislation is aimed at the disposal of various packaging forms, packagers constantly wrestle with two opposing forces: efficient, convenient packaging for the consumer and easy, effective disposability of the packaging material after it has done its primary job. One member (a senior project engineer of packaging for a Northeast specialty food company) indicated that his company was "changing to more recyclable materials or those perceived by the customer as environmentally-friendly." And the manager of packaging research for a Midwest firm stated that "we are changing to environmental marketing in order to remain competitive."

Despite the rough economic times, members of the panel (63 percent) told us they are planning on making significant changes in packaging line machinery in their operations during the next year. Approximately 48 percent of these respondents expect to spend $200,000 or more on packaging equipment this year, with 9.5 percent spending between $40,000 to $59,000.

Many respondents are looking to replace old equipment and update lines. "I need to replace existing equipment which is not adaptable to a new package and a new product" said the senior vice president of a beverage company. A director of technical services for a specialty food processor is planning on "replacing a filler with newer, higher speed equipment which will enable the use of lower-cost cartons and shippers." A director of research and development for a pet food firm is also looking to replace some equipment with high speed models, but is also "looking at some equipment which can fill a greater amount of sizes."

In addition to the replacement of equipment, many panel members are eagerly seeking the upgrades that new technology provides, particularly automation. One member (a manager

of packaging engineering and maintenance for a confectionery company) stated that "it is time to automate various labor intensive functions." A vice president of a chocolate company indicated that his firm is looking to replace people with more automatic equipment. Automation, weight control, and simplified changeovers were high on the list of one corporate industrial engineer.

And, for the second year in a row, our panelists overwhelmingly affirmed (84 percent) that they are willing to pay for automation on a new piece of equipment. Many respondents explained that automation was needed to insure uniform weights, rework reduction, and quality control. A vice president of manufacturing for a dairy firm pointed to reliability, variable cost/reduction in labor, and information feedback as his reasons for having automation on his equipment. "Our packaging lines are simple," says a plant manager for a Northeast poultry company, "and our volumes are low. Automation is a realistic cost for small processors and the development of 'pocket' systems would be to our benefit." And two respondents summed up their needs very directly and succinctly: "cost, cost, cost" and "quality, quality, quality."

However, a mere nine percent responded that they would not pay the extra price for such technology, with the president of a firm citing "automation tends to lead to less quality control in products." One CEO indicated that his company uses very low-cost labor and the package is only a part-time cost of the entire operation. "We've over-automated too far," explained a technical services engineer for a West coast firm. "Operators lose touch with the reality of packaging problems and defects."

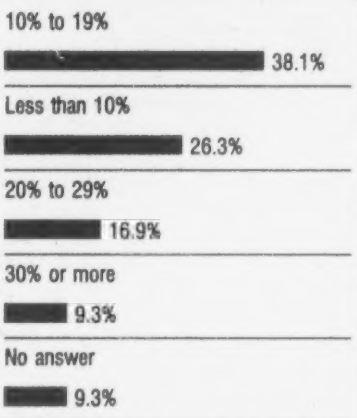
Comparison and contrast

In our survey, panelists were asked to describe the relationship between packaging materials/corresponding machinery capabilities and packaging design/development. The question revealed several interesting viewpoints, with almost 43 percent responding that materials and machinery are consistent with packaging design and development. "Good planning and communication between packaging research, packaging design, product development and marketing is the key," responded a senior director of product development for a candy company. Many panelists responded with a simple: "they must go hand in hand."

Coming in a close second, 38 percent of the survey's respondents indicated that materials/machinery lag behind packaging development and design. "Equipment manufacturers need to communicate with the end user and material suppliers to keep up on packaging changes and developments," said a manager of quality assurance for a Midwest processor. Another respondent indicated that "the market changes too fast for machine manufacturing to keep up" (plant engineer with a supermarket chain). And a research specialist with a Midwest company claimed that the lag was due to "poor engineering! The

Percentage of Development Cost

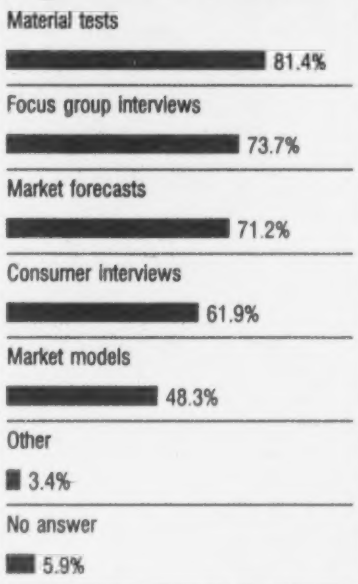
Respondents were asked to indicate what percentage of product development cost is represented by packaging.



Source: Food Engineering's Packaging Survey 1992.

Packaging Design Process

Respondents were asked to check the steps their firms include in a new package design process. (Company does own design.)



Source: Food Engineering's Packaging Survey 1992.

PACKAGING BUYERS SURVEY

Respondents to this year's survey were asked to select, from a group of six factors, the top three which exert the most influence on the final choice of a packaging material. The six factors: consumer preferences, cost, design feasibility, environmental issues, historical reasons, and market test results.

Cost factors won handily, with 87 percent of the respondents indicating that cost is still one of the most important, if not the most important factor in selecting a packaging material. Consumer preferences came in with a solid second place finish at 75 percent. Approximately 38 percent indicated that design feasibility was most important to them, followed by environmental issues (37 percent), market test results (33 percent), and historical reasons with 21 percent.

What does all this mean? If these answers are any indication, then the industry is still very cost conscious, since it is very difficult to adequately create a package that meets consumer demands and preferences, is relatively easy to design, is environmentally sound, and above all, does not cost the supplier and customer an outrageous sum to manufacture. These results probably point out, too, that overpackaging exists very little, since it costs all parties great sums of money and is simply a waste of everything, from raw materials to production time.

We also asked the panel: "If you had to pick one material that looks endangered, what would it be?" By a slim margin, 34 percent chose metal (other than aluminum) as an endangered material. Glass followed with 23 percent, plastic with almost 20 percent, and paperboard with almost eight percent. These results are not meant to indicate, however, that any of the listed materials are *actually* endangered. It simply shows that the choice of a material depends on many factors, and no one material is perfect for every application. Many respondents, for example, may simply prefer plastic over glass, or paperboard over plastic, and predict that a material that appears less popular to them may be endangered in a few years.

package is not complex, but the machinery can't run efficiently with acceptable maintenance costs."

Yet, 13.5 percent of our respondents told us they think materials and machinery are ahead of package development. "Design engineering for mechanical applications is generally straightforward," stated a plant manager for a poultry processor, "and appropriate packaging providing benefit to the processor and the consumer is not." One panel member attributed the leading status for materials and machinery as a "lack of creative thinkers." And, another panelist (vice president of manufacturing for a baking company in the South), simply indicated that "package design in our industry is dictated by machinery."

Future trends

In this year's survey, our panel members were asked to list major trends they see emerging in food packaging over the next two years. The overwhelming trend stated by a large number of the respondents was environmentally-friendly packaging. Many respondents indicated that there will be more recyclable packaging and more source reduction (reduced overpackaging) in order to meet continuing environmental challenges. Many panelists stated that improved microwave capabilities are important, as are improved barrier properties with fewer layers and better graphics capabilities. Extremes in packaging sizes—jumbo, family, and single versus two servings—will emerge as important trends as well.

Our panelists also receive the opportunity in the survey to describe a material or packaging system they need, but have been unable to find. Some examples:

- A sales and marketing vice president wants "a biodegradable film that will bleach out the name in the sun, dissolve from the outside in, and still last six months."
- A director of quality control/R&D is looking for "a film or bag that has antiseptic or microbial prevention capabilities. This could be beneficial as a final step in the packaging of fresh items."

FE's Packaging Buyers Survey costs $150 and is available by contacting Anne Hartnett at 215-964-4444; fax: 215-964-2915. ▲